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10/585,857

07/12/2006

Masaki Suzuki

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EXAMINER

LIU, LI

ART UNIT

PAPER NUMBER

2624

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                      |  |
|------------------------------|--------------------------------------|--------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/585,857 | <b>Applicant(s)</b><br>SUZUKI ET AL. |  |
|                              | <b>Examiner</b><br>LI LIU            | <b>Art Unit</b><br>2624              |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period **will** apply and **will** expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply **will**, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 5-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 5-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 07/12/2010 has been entered.

### ***Response to Amendment***

2. The amendment received on 06/11/2010 has been entered and made of record.

3. In view of the amendment to the claims, the cancellation of claims 2, 4, 11-15, and 17-19, amendment to claims 1, 8, and 9 are acknowledged.

Claims 1 and 5-9 are now pending.

### ***Response to Arguments/Remarks***

4. Applicant's arguments filed on 06/11/2010 with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection herein below, necessitated by the amendment. To the extent that the current arguments apply, each will be addressed below.

Applicant correctly noted on page 10 of the remarks that the Fukunaga reference (US 6169821) discloses a) picture codec system, b) both intra-frame and inter-frame

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coding have been standardized in MPEG, c) intra-frame coding can be performed at regular intervals and inter-frame coding can be carried out at other times, d) with inter-frame coding, each frame is coded with reference to the immediately preceding frame, and e) frames coded by inter-frame coding are predicted from the preceding frames.

Applicant argues,

“nothing has been found in the Fukunaga et al. citation that is believed to teach or suggest that a mode selection unit adaptively selects, for each frame, either a first coding mode of coding a frame of interest by referring to another frame using an inter-frame coding method or a second coding mode of coding a frame of interest without referring to another frame using an intra-frame coding method, and that a decoding unit locally decodes coded image data of the frame of interest only when the frame of interest had been encoded in the second coding mode selected by the mode selection unit and stores the decoded image data of the frame of interest into the storage unit, as recited by amended Claim 1.”

The Examiner respectfully disagrees. Indeed, Fukunaga does disclose a mode selection unit (**see Fukunaga, Fig. 1, the Intra/Inter decision unit 306**) to adaptively select (**see Fukunaga, col. 5, lines 19-24, “...intra-frame coding is selected at regular intervals (once every thirty frames, for example)”**) for each frame either a first coding mode (inter-frame coding) or a second coding mode (intra-frame coding). By definition, intra-frame coding is performed relative to information that is contained only within the current frame without referring to any other frames in the video sequence. Inter-frame coding, on the other hand, is expressed in terms of one or more neighboring frames. The “inter” part of the term refers to the use of inter frame prediction.

In addition, Fukunaga discloses a decoding unit (**Fukunaga, Fig. 1, unit 306**) locally decodes coded image data (**Fig. 1, decoding unit 303 receives coded data from coding unit 302**) only when the frame of interest had been encoded in the second coding mode (**Fig. 1, input from the Inter/Intra decision unit 306 to the decoding unit 303**). The decoded image data is stored in the storage unit (**Fig. 1, the Frame memory unit 304, reference frame updating unit 309, and reference frame memory unit 305, also see col. 5, lines 48-58**).

Therefore, the Examiner respectfully submits that the new rejections set forth below are proper.

### ***Claim Objections***

5. Claims 1, 8, and 9 are objected to because of the following informalities:

Claim 1 recites “each frame” in line 3, “a frame of interest” in lines 4 and 5, respectively. Although it appears as though they all refer to one and the same frame, Applicant is advised to clarify this by using consistent nomenclature (for example, ‘each frame of interest’, and ‘the frame of interest’).

Claims 8 and 9 are objected to for the same reason as stated above re claim 1.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 101***

6. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 9 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 9 is drawn to “**computer-readable storage medium**”. However, the specification does not preclude transitory signals by way of explicit definition. Given the broadest reasonable interpretation consistent with the specification and state-of-the-art, the full scope of the claimed “computer-readable storage medium” covers both transitory and non-transitory media. Transitory media includes signals which do not fall within the definition of a process, machine, manufacture, or composition of matter (*In re Nuijten*), and are therefore non-statutory. The examiner suggests adding the modifier “**non-transitory**” to the claimed medium.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 5, 6, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukunaga et al. (hereafter referred to as “Fukunaga”, US 6169821, IDS), in view of Tong et al. (hereafter referred to as “Tong”, US 5982435, IDS), and further in view of Kishi (US 2002/0031182, IDS).

Regarding claim 1, Fukunaga discloses a moving image coding apparatus that sequentially inputs and codes image data of frames constituting a moving image (**Fukunaga, Fig. 1**), the apparatus comprising:

a mode selection unit (**Fukunaga, Fig. 1, numeral 306 is the Intra/Inter decision unit**) that adaptively selects, for each frame, either a first coding mode of coding the frame of interest by referring to another frame using an inter-frame coding method or a second coding mode of coding the frame of interest without referring to another frame using an intra-frame coding method (**please refer to Examiner's Response to Arguments/Remarks**);

a storage unit that stores a frame image (**Fukunaga, Fig. 1, reference frame memory unit 305**);

a segmentation unit that segments image data of an input frame into a plurality of blocks (**Fukunaga, col. 9, lines 34-40**);

a decoding unit (**Fukunaga, Fig. 1, unit 303**) that locally decodes coded image data of the frame of interest (**Fig. 1, unit 302**) only when the frame of interest had been encoded in the second coding mode selected by said mode selection unit (**please refer to Examiner's Response to Arguments/Remarks, output from Intra/Inter decision unit 306 is feed to decoding unit 303**) and stores the decoded image data of the frame of interest into said storage unit (**Fukunaga, Fig. 1, frame memory unit 305**);

a computation unit that (i) extracts, from a previous frame that has been locally decoded and stored in said storage unit by said decoding unit, predicted data of a block image (**Fukunaga, Fig. 21 and col. 1, lines 30-44, the inter-frame or P-frame coding**

**are predicted from the preceding frames)** obtained by segmentation by said segmentation unit and outputs a block obtained by subtracting the predicted data from the segmented block image, if the mode selected by said mode selection unit is the first coding mode (**prediction and coding of difference signal only applies to inter-frame coding, see more details below referring to the Tong reference**), or (ii) outputs the block segmented by said segmentation unit, if the mode selected by said mode selection unit is the second coding mode (**Fukunaga, Fig. 21 and col. 1, lines 30-44, the intra-frame or I-frame coding, by definition, are performed relative to information that is contained only within the current frame, and not relative to any other frame in the video sequence**);

Fukunaga does not expressly disclose the computation details of subtracting the predicted data from the block. Fukunaga does not disclose rounding down coded data from a least significant bit to adjust an amount of code data.

In the same field of endeavor, Tong discloses an image coding apparatus which performs discrete wavelet transform (DWT) to blocks obtained by subtracting the predicted data from the block image data (**Tong, Fig. 7**), and Kishi discloses an image coding device that encodes the spatial frequency component data (**Kishi, Fig. 1C, Discrete Wavelet Transformation unit 110**) for each bitplane to generate code data for each bitplan (**Kishi, Fig. 10**), adjusts a code data amount by discarding code data corresponding to bitplanes from a least significant bit position to a predetermined bit position (**Kishi, Figs. 10 and 15, bitplanes are deleted in ascending order, and the number of bitplanes to be deleted is determined by comparing code length of**



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**coded data A, with a threshold, referred to as “designated code length B”), and outputs remaining code data as the code data of the segmented block (Kishi, Fig. 12).**

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Tong and Kishi with that of Fukunaga to yield the invention as described in claim 1, because both coding an inter-frame with reference to a preceding I-frame, and bitplane round down to adjust the amount of coded data are well-known in the art, the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable.

Regarding claim 5, the combination of Fukunaga, Tong, and Kishi discloses the apparatus according to claim 1, further comprising an instruction unit that instructs whether to discard code data of bitplanes by said adjusting unit (**Kishi, Fig. 15, Steps 1505 and 1506**).

Regarding claim 6, the combination of Fukunaga, Tong, and Kishi discloses the apparatus according to claim 1, wherein said mode selection unit selects the second coding mode for a frame which is input for the first time after a number of input frames becomes a predetermined number (**Fukunaga, col. 5, lines 19-24, “...intra-frame coding is selected at regular intervals (once every thirty frames, for example)...”**).

Regarding claims 8 and 9, the limitations of the claims are rejected for the same reasons as set forth in the rejection of claim 1 above.

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukunaga (US 6169821), in view of Tong (US 5982435) and Kishi (US 2002/0031182), and further in view of Islam et al. (hereafter referred to as "Islam", US 6697521).

Regarding claim 7, the combination of Fukunaga, Tong, and Kishi discloses the apparatus according to claim 1. Kishi does not however expressly disclose using bit-shifting to delete the selected number of lower bitplanes. However, discarding lower bitplane data by bit-shifting is well known and expected in the art, as for example taught by Islam (Islam, Fig. 2a). It would have been obvious to one of ordinary skill in the art at the time of the invention to delete lower bitplane data by bit-shifting, because it is one of the most popular ways of removing data in computing, the other choice would be replacing the bits with zeros.

### ***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LI LIU whose telephone number is (571)270-5363. The examiner can normally be reached on Monday-Friday, 8:00AM-4:30PM, EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed, can be reached on (571)272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

L.L.

/Samir A. Ahmed/

Supervisory Patent Examiner, Art Unit 2624